



**THE DATASHEET OF
ES3D-13**

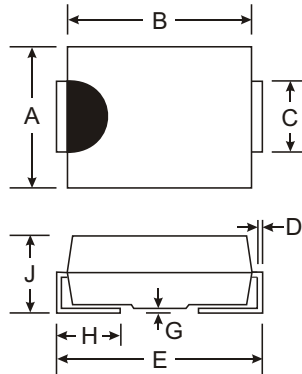


Features

- Glass Passivated Die Construction
- Super-Fast Recovery Time For High Efficiency
- Low Forward Voltage Drop and High Current Capability
- Surge Overload Rating to 100A Peak
- Ideally Suited for Automated Assembly
- **Available in Lead Free Finish/RoHS Compliant Version (Note 4)**

Mechanical Data

- Case: SMB/SMC
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Solder Plated Terminal - Solderable per MIL-STD-202, Method 208
- Also Available in Lead Free Plating (Matte Tin Finish). Please see Ordering Information, Note 6, on Page 3
- Polarity: Cathode Band or Cathode Notch
- Mounting Position: Any
- Ordering Information: See Page 3
- Marking: Type Number, See Page 3
- SMB Weight: 0.093 grams (approximate)
- SMC Weight: 0.21 grams (approximate)



| Dim | SMB | | SMC | |
|----------------------|------|------|------|------|
| | Min | Max | Min | Max |
| A | 3.30 | 3.94 | 5.59 | 6.22 |
| B | 4.06 | 4.57 | 6.60 | 7.11 |
| C | 1.96 | 2.21 | 2.75 | 3.18 |
| D | 0.15 | 0.31 | 0.15 | 0.31 |
| E | 5.00 | 5.59 | 7.75 | 8.13 |
| G | 0.10 | 0.20 | 0.10 | 0.20 |
| H | 0.76 | 1.52 | 0.76 | 1.52 |
| J | 2.00 | 2.62 | 2.00 | 2.62 |
| All Dimensions in mm | | | | |

A, B, C, D, Suffix Designates SMC Package
 AB, BB, CB, DB Suffix Designates SMB Package

Maximum Ratings and Electrical Characteristics @ T_A = 25°C unless otherwise specified

Single phase, half wave, 60Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

| Characteristic | Symbol | ES3A/AB | ES3B/BB | ES3C/CB | ES3D/DB | Unit |
|---|-----------------------------------|-------------|---------|---------|---------|------|
| Peak Repetitive Reverse Voltage | V _{RRM} | 50 | 100 | 150 | 200 | V |
| Working Peak Reverse Voltage | V _{RWM} | | | | | |
| DC Blocking Voltage | V _R | | | | | |
| RMS Reverse Voltage | V _{R(RMS)} | 35 | 70 | 105 | 140 | V |
| Average Rectified Output Current @ T _T = 100°C | I _O | 3.0 | | | | A |
| Non-Repetitive Peak Forward Surge Current 8.3ms Single half sine-wave Superimposed on Rated Load (JEDEC Method) | I _{FSM} | 100 | | | | A |
| Forward Voltage @ I _F = 3.0A | V _{FM} | 0.9 | | | | V |
| Peak Reverse Current @ T _A = 25°C at Rated DC Blocking Voltage @ T _A = 125°C | I _{RM} | 10 500 | | | | μA |
| Reverse Recovery Time (Note 3) | t _{rr} | 25 | | | | ns |
| Typical Total Capacitance (Note 2) | C _T | 45 | | | | pF |
| Typical Thermal Resistance, Junction to Terminal (Note 1) | R _{θJT} | 15 | | | | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -65 to +150 | | | | °C |

- Notes:
1. Unit mounted on PC board with 5.0 mm² (0.013 mm thick) copper pads as heat sink.
 2. Measured at 1.0MHz and applied reverse voltage of 4.0V DC.
 3. Measured with I_F = 0.5A, I_R = 1.0A, I_{rr} = 0.25A. See Figure 5.
 4. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.

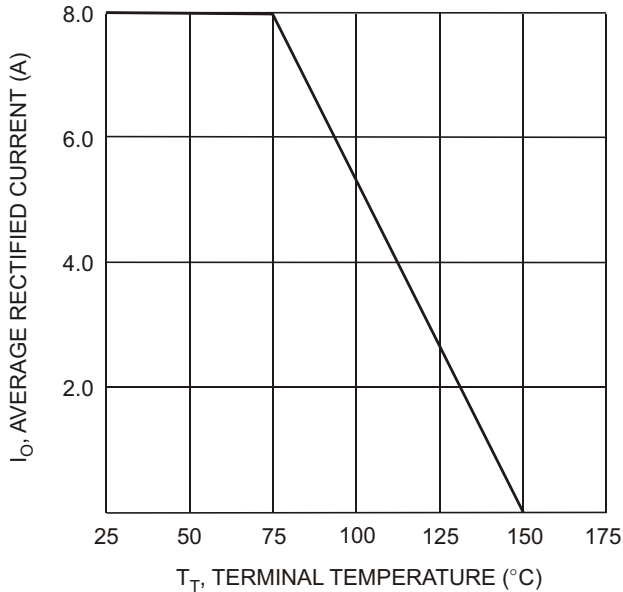


Fig. 1 Forward Current Derating Curve

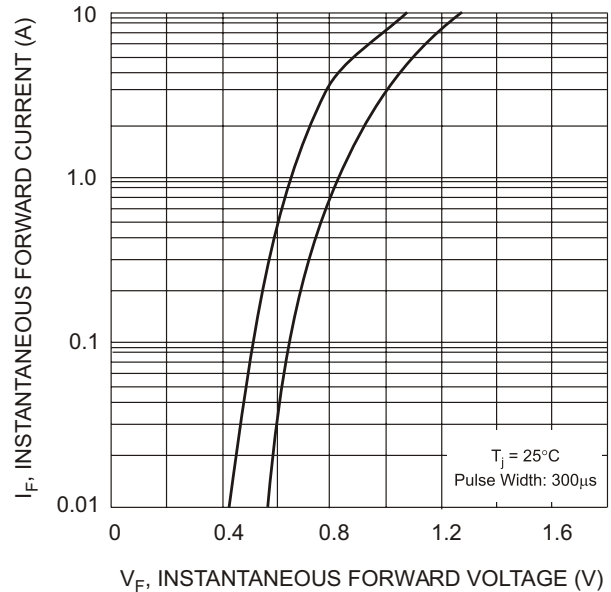


Fig. 2 Typical Forward Characteristics

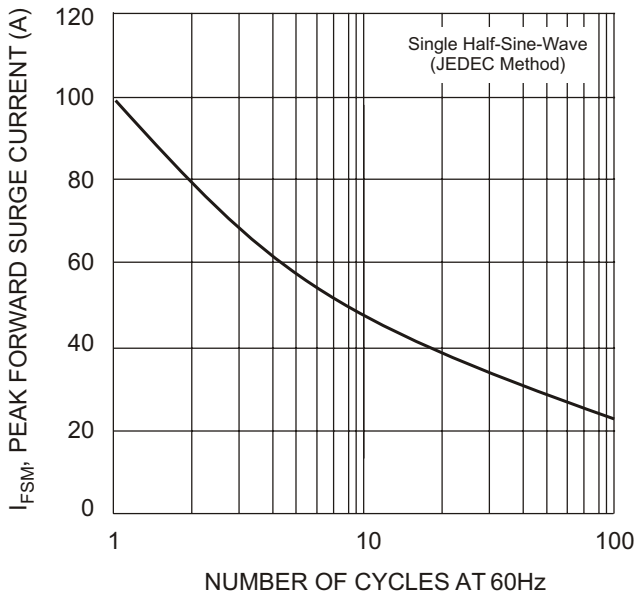


Fig. 3 Surge Current Derating Curve

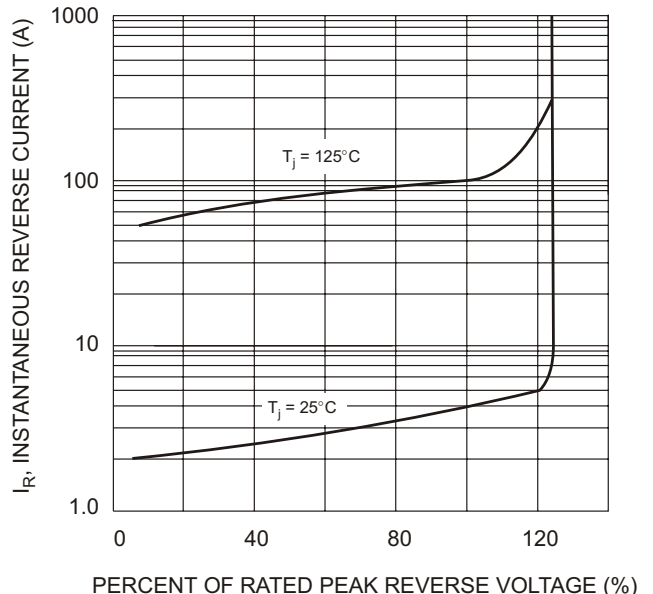
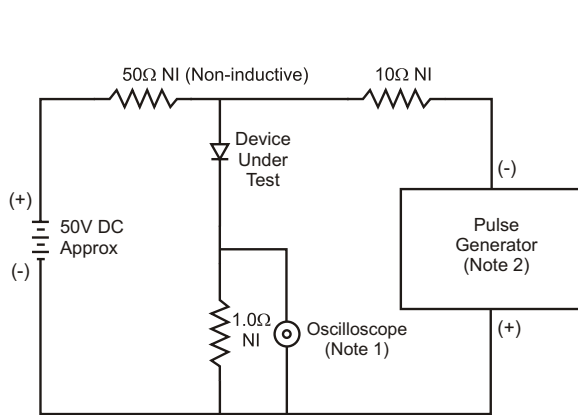
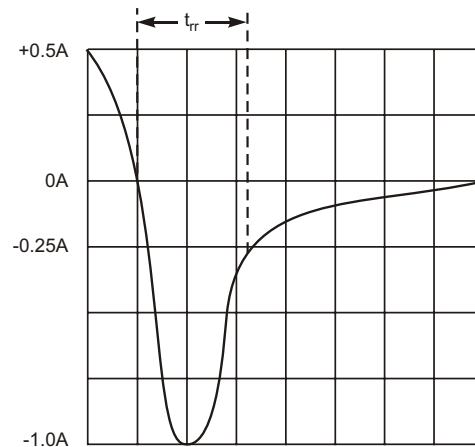


Fig. 4 Typical Reverse Characteristics



- Notes:
1. Rise Time = 7.0ns max. Input Impedance = 1.0MΩ, 22pF.
 2. Rise Time = 10ns max. Input Impedance = 50Ω.



Set time base for 50/100 ns/cm

Fig. 5 Reverse Recovery Time Characteristic and Test Circuit

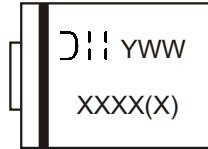
Ordering Information (Note 5 & 6)

| Device* | Packaging | Shipping |
|---------------------|------------|--------------------------------------|
| ES3x-13 ES3xB-13 | SMC SMB | 3000/Tape & Reel 3000/Tape & Reel |

* x = Device type, e.g. ES3A-13 (SMC package); ES3AB-13 (SMB package).

- Notes:
4. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.
 5. For Lead Free Finish/RoHS Compliant version part number, please add "-F" suffix to the part number above. Example: ES3A-13-F.



Marking Information



XXX = Product type marking code, ex: ES3A (SMC package)
 XXXX = Product type marking code, ex: ES3AB (SMB package)
 D||| = Manufacturers' code marking
 YWW = Date code marking
 Y = Last digit of year ex: 2 for 2002
 WW = Week code 01 to 52

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